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WATER MARKETS AS A RESPONSE TO CLIMATE CHANGE

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CONTENTS

INTRODUCTION

It does not take a crystal ball to know that water scarcity will be one of the major challenges faced by the western United States in the 21st century. Indeed, it already is. The past decade has seen severe droughts in Texas, California and elsewhere that have cost states billions of dollars. Further, even when not officially in drought, many western areas have experienced bitter fights over water. In the coming decades, these problems are almost certain to increase, as climate change will place serious, additional strain on the ability of western states to meet their water needs. If left unaddressed, such strains will cause increased drought and may change the economic viability of agricultural production in some areas.

Yet despite such serious issues, water usage in much of the United States remains highly inefficient, and restrictions on the ability to transfer water mean that significant quantities of the precious commodity are not available for their most valuable use. Indeed, legal doctrines in some states effectively punish water conservation and encourage wasteful use. Increased efficiency could free up millions of acre-feet[1] of water and would help alleviate the growing stresses on water availability.

To this end, the present study assesses several proposed changes to state regulation of surface water that could help make its use more efficient and could help states adapt better to climate change. It is focused primarily on twelve western states, and identifies six policy reforms that states could enact to address the problem of water scarcity:

1. Eliminate restrictions on changing the use of water;
2. Recognize water storage as a beneficial use sufficient to maintain a water right;

1. An acre-foot is a standard unit of measure used in discussion of water resources. It is defined as the amount of water needed to fill an acre of surface area to a depth of one foot, or approximately 325,853 gallons.

3. End "use-it-or-lose-it" doctrines that undermine incentives for rights holders to increase water efficiency;
4. Eliminate amorphous, non-environmental, third-party considerations from the approval process;
5. Create or expand an expedited approval process for short-term leases;
6. Use water banks to facilitate water transfers.

All of these proposed changes increase flexibility and use of water markets, which will be an important strategy to meet the challenges of climate change in the West.

INCREASING THE STRAIN ON WATER AVAILABILITY

Between 2010 and 2014, Texas endured one of the most severe droughts in its history. Based on the Palmer Drought Severity Index, the 2010 drought was the second longest lasting and included the driest 12-month period on record.[2] In 2011 alone, the resulting agricultural losses were nearly $8 billion.[3] In 2015, Texas was subjected to the flip side of drought and experienced severe flooding.[4] However, Texas' experience is hardly unique. From 2011 to 2017, California experienced one of its worst droughts ever, which also ended in severe flooding.[5]

In the coming decades, events like these are expected to grow more frequent due to factors like population shifts and climate change. While the precise effects of climate change remain unknown, it could exacerbate current water scarcity problems in many ways. Hotter temperatures, for example, will increase water evaporation from soil, which makes certain areas more susceptible to drought. These rising temperatures can also alter weather patterns, which would lead to less rainfall in parts of the West or longer dry periods punctuated by heavy flooding.[6] Such changed rainfall patterns could themselves lead to periods of prolonged drought and later, heavy rain and flooding. As temperatures increase, certain areas will no longer be suitable for growing particular crops, while other areas may become more productive.[7] To give one example, the Intergovernmental Panel on Climate Change (IPCC) projects "large declines in land suitability for California viticulture by 2050 (with increases further north)."[8] Finally, climate change will exacerbate issues involving some endangered species. With respect to this, the IPCC further notes that "a number of ecosystems in North America are vulnerable to climate change. For example, species in alpine ecosystems are at high risk due to limited geographic space into which to expand."[9]

The American West has long faced the challenges associated with procuring sufficient water supply to meet demand. But for this very reason, any worsening of these problems because of climate change requires serious action and thus, water in the West must be conserved and used ever more efficiently.

WATER TRADING AS A MEANS OF CLIMATE ADAPTATION

To cope with these challenges, water markets are a key strategy, as they can increase the efficient use of water in several ways. First, markets promote frugality. When water is scarce, users are inspired to make do with less, and thus they are more likely to reduce waste and find substitutes for water. Prices serve as signals to users about the scarcity of a resource. If water prices are kept artificially low—as they often are for a variety of reasons—people will act as if it is plentiful and will be less likely to conserve. By contrast, higher prices create incentives for individuals and businesses to find more efficient ways to meet their water needs. Research suggests that a 10 percent increase in water prices reduces demand for water in agriculture by nearly 5 percent in the short term, while residential demand decreases 3-4 percent in the short term and 6 percent in the long term.[10]

Even where prices remain low, the ability to sell "saved" water can provide a substantial incentive to use water more efficiently. When every gallon of water not used represents a potential profit opportunity, the incentive to find new ways to conserve increases dramatically. And, water storage can also be used as a hedge to protect against extended dry periods.

In addition, markets facilitate transfer of water toward its highest and best use. The most beneficial uses of water will inevitably change over time. For example, a factory or mine that once used considerable amounts may go out of business or the water needs of a city may grow as its population

2. "Water for Texas: 2017 State Water Plan," Texas Water Development Board, 2017, p. 32. http://www.twdb.texas.gov/waterplanning/swp/2017/doc/SWP17-Water-for-Texas.pdf?d=1516295903373.

3. "Drought cost Texas close to $8 billion in agricultural losses in 2011, study finds," *Austin American Statesman*, March 21, 2012. http://www.statesman.com/news/state--regional/drought-cost-texas-close-billion-agricultural-losses-2011-study-finds/gQb-98B7ZqTFfsxV8XKIWoK.

4. John Nielsen-Gammon, "Texas state climatologist on climate change, floods and droughts," *Houston Chronicle*, June 2, 2015. http://www.houstonchronicle.com/local/gray-matters/article/Texas-state-climatologist-on-climate-change-6302140.php.

5. Shelby Grad, "Most of California is out of the drought," *Los Angeles Times*, Feb. 23, 2017. http://www.latimes.com/local/lanow/la-me-drought-gone-20170223-story.html.

6. "Fifth Assessment Report," Intergovernmental Panel on Climate Change, 2014, pp. 735, 745. https://www.ipcc.ch/report/ar5.

7. Ibid., p. 1462.

8. Ibid.

9. Ibid., p. 1458.

10. Terry L. Anderson et al., *Tapping Water Markets* (RFF Press: 2012), pp. 13-14.

does. Alternatively, a farmer may switch from growing one type of crop to another, less water-intensive one. As these shifts occur, water originally dedicated to one purpose can be rededicated to new ones. Accordingly, states like Texas formally recognize that meeting future water needs will require the "voluntary redistribution" of water rights.[11]

There are two ways for these transitions to occur. The first is through political decision-making; the other is through markets. As to the former, politicians decide which uses of water are most important and require it to be shifted accordingly. Political decision-making, however, has generally proven to be a bad way of allocating resources. It would be a mistake to think that questions about the most important use of water can be decided in the abstract, for example, by deciding that agriculture is more important than municipal use or vice versa. Some use of water for agriculture is essential. Other agricultural water use (say, to grow a water intensive crop on marginal land) may make little economic sense. Further, to properly decide between potential uses of water requires knowledge of local conditions that is often beyond the grasp of the regulator.[12] In addition, political allocation of water is vulnerable to rent seeking and cronyism, wherein water is allocated not to those who value it most but rather to those with the most political pull.[13]

By contrast, water markets "provide a way of adapting to a dynamic world of changing human demands for water and the changing supplies of it."[14] This is because if the owner of a resource values it less than some other party, then she should be willing to sell it to that party for a mutually agreeable price. Market transactions require a willing buyer and a willing seller, both of whom conclude that they will be better off as a result of the transfer. As such, they are more likely to reallocate water efficiently than are bureaucratic judgments about its best use.

Market adaptation is particularly useful with respect to climate change because it does not require advanced knowledge of what the effects of climate will be. If the effects of rising temperature turn out to be greater than anticipated, the incentives for market adaptation will increase correspondingly.

RESTRICTIONS ON WATER TRADING

While the particulars of water law differ, all states in the western region use some form of the "prior appropriation" system for water rights, at least for surface water. Under this system, the right to divert and use water is based on historical use. A typical water right gives the owner the right to divert a given amount of water each year from a particular place for a specified use. States maintain a list of recognized "beneficial uses" of water, and each water right must be designated for one of those uses. In cases like drought where there is not enough water for all rights holders, older or "senior" rights are given priority over newer, "junior" ones.

The current system of water regulation in the West differs in several ways. In an efficient market system, owners decide for themselves how best to use their property subject to specific legal prohibitions, and transfers depend only on a willing buyer and seller agreeing to the details of the transaction. However, under the prior appropriation system, transfers also typically require the pre-approval of regulators, and often many third parties can also object. Even absent a change in ownership, a right holder will often need pre-approval to change the how his water is used and can only use water in a way formally designated by the state as beneficial. Regulators will typically be required to assess whether a transfer will negatively affect the ability of other rights holders to access their own water, as well as the environmental impact of the transfer. In addition, many states require consideration of broader economic factors such as the effect a transfer might have on the local community. Obtaining approval for a transfer can take years and cost many thousands of dollars, sometimes representing a significant portion of the total cost of the transfer.

The need for pre-approval and other restrictions on transfers create what economists refer to as "transaction costs." The higher the transaction costs, the more potentially valuable transfers will not occur because the cost of the approval process exceeds the benefit of the transfer. Transaction costs are especially problematic when it comes to climate adaptation. Because climate change occurs gradually over the course of decades, adaptation will often require a series of small changes and improvements made over time. High transaction costs, however, are particularly likely to impede these smaller changes because the value of each individual transaction is likely to be low, even as they are cumulatively important.

The prior appropriation system can also unintentionally undermine incentives to be frugal with water use, as many states currently incorporate a "use-it-or-lose-it" doctrine into their water rights. Under this system, a water right owner who does not use their entire allocation will forfeit the unused amount. Similarly, this policy can mean that individuals who find ways to use water more efficiently cannot

11. Kathleen Hartnett White et al., "The Case for a Texas Water Market," Texas Public Policy Foundation April 2017, p. 3. https://www.texaspolicy.com/library/doclib/2017-04-RR-WaterMarkets-ACEE-KHartnettWhite.pdf.

12. See, e.g., F.A. Hayek, "The Use of Knowledge in Society," *American Economic Review* 4 (1945), pp. 519-30. http://www.econlib.org/library/Essays/hykKnw1.html.

13. See, e.g., Sean Callagy, "The Water Moratorium: Takings, Markets, and Public Choice Implications of Water Districts," *Ecology Law Quarterly* 35:2 (2008), pp. 223-62. https://scholarship.law.berkeley.edu/cgi/viewcontent.cgi?article=1865&context=elq.

14. Terry L. Anderson, "Dynamic Markets for Dynamic Environments: The Case for Water Marketing," *Daedalus* 144:3 (Summer 2015), p. 87. https://www.mitpressjournals.org/doi/abs/10.1162/DAED_a_00344?journalCode=daed.

benefit financially and indeed may be penalized for doing so. For example, a farmer who has a water right to 100 acre-feet a year for irrigation use and reduces his water consumption to 90 acre-feet a year through more efficient management may be "rewarded" for his conservation efforts by having his water right reduced permanently from 100 to 90 acre-feet a year. According to states that employ this model, the theory behind it is that the extra ten acre-feet were "waste" that the owner should have never had a right to in the first place.

INEFFICIENCY IN THE CURRENT WATER SYSTEM

The restrictions on the transfer and use of water described above have led to major inefficiencies in water usage. These can be seen in the different prices paid for water put to different uses. For example, urban water users typically pay between $1 to $3 per thousand gallons of water. By contrast, many farmers pay only a few pennies per thousand gallons.[15] To take an extreme example, in 2001, farmers in California's Imperial Irrigation District paid $13.50 per acre-foot of water, while a development near the Grand Canyon National Park was willing to pay $20,000 per acre-foot from the same source.[16] These disparities insulate certain sectors from the price signals of scarcity, which impedes economical conservation. The price disparities also suggest that there are potentially large gains from trade through water markets that are not currently being realized.

The disparity can also be seen in the prices gained for transfers. In 2005, the average price for water transfers from agriculture to municipal use was $7000 per acre-foot a year more than the price for a transfer from one agricultural user to another.[17] In an efficient system, these differences would be eliminated by shifting water away from the lower value uses in favor of higher value ones. After all, why would a farmer sell to another farmer if he can make thousands of dollars more per acre-foot selling the same water to a non-farmer? Yet the time and cost of getting an approval for changing the use of water means that water is often trapped in less valuable uses. In other words, the transaction costs associated with transfers are too high.

When it comes to increasing the efficiency of the water use system, the bad news is also the good news. Current water usage is woefully inefficient, due significantly to restrictions on how water is regulated. The flip side of this is that by correcting and removing these barriers, states could greatly increase the efficient use of water.

The power of markets in water can be seen in the case of transfers for instream use. Historically, state-recognized beneficial uses of water were limited to uses that involved diversion from its natural source. This meant that those who were willing to pay to keep water instream (either for commercial or environmental conservation purposes) could not do so. Over time, most states came to recognize instream uses as beneficial, and therefore as a valid legal use for a water right.

However, this alone did not solve the problem, as water in most western areas had already been fully allocated (meaning that no new water rights could be issued). Thus, for water to be dedicated for instream purposes, existing water rights must be transferred. To deal with this, some states have set up special expedited processes whereby water rights can be transferred specifically for instream purposes.

Overall, this system has been a success. California's Scott River Valley, for example, long faced challenges related to the preservation of an endangered salmon species. Heavy diversion of water for irrigation imperiled the viability of the salmon population due to their need to return to the river in which they were born to spawn. To address this, the Scott River Water Trust, a non-profit conservation organization, negotiated voluntary agreements whereby local farmers were paid to temporarily refrain from the diversion of water during specified low-flow periods. These agreements resulted in a more than five-fold increase in Coho salmon returning to the area between 2008 and 2011.[18]

OPTIONS FOR REFORM

Despite operating under the same basic prior appropriation system, western states differ significantly in how open they are to water transfers, frugality and savings. A survey of western states yields six potential legal reforms that could greatly increase the long-term efficiency of the water system—each of which are already in operation in some states. While these reforms are not comprehensive, each would go a long way to help western states meet their growing water scarcity challenges.

15. Peter W. Culp et al., "Shopping for Water: How the market can mitigate water shortages in the American west," *The Hamilton Project Discussion Paper* No. 2014-05, October 2014, p. 10. http://www.hamiltonproject.org/assets/files/how_the_market_can_mitigate_water_shortage_in_west.pdf.

16. Jedidiah Brewer et al., "2006 Presidential Address: Water Markets in the West: Prices, Trading and Contract Forms," *Economic Inquiry* 46:2 (April 2008), p. 91. https://pdfs.semanticscholar.org/dc20/7de48247270812df5c74a487068ddd3399ce.pdf.

17. Ibid, p. 101 (fig. 1).

18. Reed Watson, "Scott River Water Trust: Improving Stream Flows the Easy Way," Property and Environmental Research Center, Jan. 3, 2014. https://www.perc.org/articles/scott-river-water-trust-improving-stream-flows-easy-way.

TABLE I: STATE POLICIES ON WATER MARKETS AND TRANSFERS

	AZ	CA	CO	ID	MT	NE	NM	NV	OR	SD	TX	WA
Restrictions on change of use?	No	No	No	Yes	No	No	No	No	No	Yes	No	Yes
Storage recognized as beneficial use?	Yes	No	No	No	Yes	No	No	Yes	No	No	No	No
Can keep/sell conserved water?	No	Yes	No	Yes	Yes	No	Yes	No	Yes	No	Yes	Yes
Amorphous third-party considerations for approval?	No	Yes	Yes	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No
Expedited Review for Short-Term Leases?	No	Yes (but limited to one year and remains extensive)	Yes (but remains extensive)	Yes	Yes	Yes	Yes	Yes	No	No	No	Yes
Active water banking?	Yes	Yes	No	Yes	No	Yes	No	No	Yes	No	Yes	Yes

Eliminate restrictions on change of use

Water rights are limited to a specific use, which must be among a list of state-designated "beneficial uses." While the categories of uses that are deemed beneficial tend to be broad (e.g. agriculture, mining or municipal), they are not comprehensive and do not include all potential valuable uses of water. Even where a water right holder simply wants to change between one beneficial use and another, they may still face a daunting regulatory approval process. For example, in one case, the city of Marshall, Texas saw its application to add an additional beneficial use to its water right languish for six years before ultimately being withdrawn.[19]

As if this were not bad enough, some states go further and impose outright prohibitions on certain types of water-use changes. For example, in Washington, water rights established under the "Family Farm Act" cannot be transferred for uses other than agriculture unless as part of a lease.[20] Similarly, in South Dakota, a water transfer from an irrigation water right may only be approved for domestic uses within a water distribution system (such as a municipality), and property from which the transfer is made can no longer be irrigated from any water source.[21]

Specific bans on transferring water from one beneficial use to another should be eliminated, but even the necessity of requiring approvals needs to be reconsidered. The need for pre-approval of a change of use is based on the fact that different uses of water can have different hydrological effects. For example, a large portion of water used in irrigation may ultimately return to the water source through run off. If this water were to be used for another purpose, such as municipal uses, it could leave less water for other rights holders even if the total amount of water being diverted remains unchanged.

To the extent that a change of use impedes other water right holders, it is a legitimate regulatory issue. That said, changes within a beneficial use category (such as adopting more efficient irrigation methods) can also affect water availability to junior right holders without requiring regulatory pre-approval, and certain use changes are unlikely to harm other rights holders. Some states have streamlined or automated approval processes for certain use changes. Nebraska regulators, for example, may approve a transfer without notice or a hearing if the water is to be used exclusively for irrigation.[22] States should look to expand the use of expedited or automatic approvals for cases where use changes are unlikely to harm the rights of others.

Indeed, there is little reason that water rights should be limited to a specific set of beneficial uses, at all. Historically, the beneficial use framework was a simple way to define water rights while preventing a small group from laying claim to all available water. Today, however, water in most western states is fully appropriated if not overly so. Accordingly, concerns about speculation and hoarding are no longer as relevant as they may have been in the past. As one prominent water resource economist has argued, "the whole idea of specifying any list is misdirected. Is the government sufficiently knowledgeable to recognize all conceivable and valuable uses of water?"[23]

The justification for approval of changes to the use of a water right is that different uses have different levels of return flow. Thus, a change to a use with less return flow could leave less

19. Hartnett White et al., p. 9. https://www.texaspolicy.com/library/doclib/2017-04-RR-WaterMarkets-ACEE-KHartnettWhite.pdf.

20. Wash. Stat. § 90.66.065 (2), (5)

21. S.D. codified laws § 46-5-34.1

22. Neb. Rev. Stat. § 46-291; 457 Neb. Admin. Code, Ch. 9 § 001

23. Ronald C. Griffin, Water Resource Economics (MIT Press: 2016), p. 163.

water available for other right holders. One way to avoid this problem would be to define water rights not in terms of the amount of water diverted but in terms of the amount of water consumed. As described in a recent Brookings report:

> [r]edefining the water right in terms of the amount of water *consumed* by the crops would eliminate the need for a "no-harm-to-juniors" inquiry because junior appropriators never had access to consumed water.[24]

Water rights based on consumption would therefore be more well-defined and more easily transferred with lower transaction costs. While no U.S. state currently operates under this system, it has proven successful in the Mexicali Valley of northwestern Mexico.

Recognize storage as a beneficial use

One anticipated effect of climate change will be altered weather patterns, which will change the timing of rain and snowfall. Some parts of the western United States that are not expected to receive less precipitation overall may still experience more drought because rainfall may occur more sporadically. Longer periods of little rainfall will then be punctuated by periods of heavier-than-usual precipitation. In Texas, for example, extreme rainfall events are estimated to have increased between 20 and 40 percent over the past century, with the record for monthly rainfall occurring in May 2015 at the end of one of the state's most severe droughts.[25]

A key way to adapt to this change would be through increased use of water storage. Surplus water could be captured and stored during periods of heavier rain and could then be used to relieve shortages during drier years. Storage can take a variety of forms at a variety of scales, including reservoirs and aquifers, centralized water banks and smaller groundwater recharge options. Storage can even be used to access water that otherwise would have gone to waste. The Cadiz Valley Water Conservation, Recovery, and Storage Project, for example, would capture water in the Mojave Desert before it is contaminated by salt or lost to evaporation.[26] In some cases, an individual property owner, such as a farmer, may store water themselves to be used in later years. To be most effective, however, storage projects would need to be available at various scales and not tied to a specific owner or project.

Unfortunately, many states do not formally recognize storage as a beneficial use or do not allow water to be taken for storage purposes at scale unless the ultimate use is specified in advance. For example, in 2005, California courts invalidated a permit issued by the State Water Resources Control Board to allow diversion of water for storage and resale in future years. The Board had initially granted the permit on the grounds that storing the water for later beneficial use was prudent since California lacked sufficient water during most years. However, the court later ruled that this was insufficient, and that the permit must specify the actual ultimate use of the water.[27]

Saving extra water today to meet shortages in the future is common sense. Accordingly, states should add storage as a recognized beneficial use without requiring pre-specification of ultimate use, and should allow owners of stored water to sell to other users when the time comes. Transfers into storage would still have to go through the approval process required for water transfers generally.

Let right holders keep and sell salvaged water

If a manufacturer finds a way to make its products with fewer raw materials, it saves money. This incentive to become more efficient in the use of resources is a major source of economic progress. The drive to conserve is therefore built into the market system.

When it comes to water, however, these incentives are undermined by the "use-it-or-lose-it" doctrine, which holds that a right holder who does not use his total water allocation may permanently lose the right to the excess. An example of this in action can be seen in *Southeastern Water Conservancy District v. Shelton Farms*,[28] wherein several Colorado landowners made efforts to conserve water by removing phreatophytes[29] from their property and sought to receive credit for the water saved. The court, however, held that giving the owners an "unconditional water right therefore would be a windfall which cannot be allowed, for thirsty men cannot step into the shoes of a 'water thief' (the phreatophytes)."[30]

However, the court in *Shelton Farms* had it backwards. It was the junior rights holders who received a windfall from the court's decision, gaining more water without doing anything to achieve it. By denying property owners the benefit

24. Culp et al., p. 15. http://www.hamiltonproject.org/assets/files/how_the_market_can_mitigate_water_shortage_in_west.pdf.

25. Kate Wythe "Extremely Expected: Extreme is the new (and old) normal in Texas Weather," Texas Water Resources Institute, Fall 2016. http://twri.tamu.edu/publications/txh2o/fall-2016/extremely-expected.

26. Reed Watson, "Water From the Desert: Entrepreneurs Tap into Unlikely Water Sources," Property and Environmental Research Center, Jan. 4, 2014. https://www.perc.org/articles/water-desert-entrepreneurs-tap-unlikely-water-sources.

27. *Central Delta Water Agency v. SWRCB*, 124 Cal. App. 4th (2004), p. 245.

28. 187 Colo. 181 (Colo. 1975)

29. Phreatophytes are a type of naturally occurring plant that sucks up large amounts of water from the soil.

30. *Shelton Farms*, 187 Colo., p. 188.

of their own conservation efforts, the court merely removed the incentive for future conservation.

By contrast, New Mexico law provides that "improved irrigation methods or changes in agriculture practices resulting in conservation of water shall not diminish beneficial use or otherwise affect an owner's water rights."[31] Other states should follow this model to provide incentives for conservation and increased efficiency.

Eliminate amorphous third-party considerations

Transferring water requires several government permits and approvals. However, the need for pre-approval before water can be appropriated and used places significant limits on the ability of individuals to innovate.

To some extent, requiring pre-approval for water withdrawals may be justified. For example, many states require regulators to ensure that water diversions will not have harmful environmental consequences that would not otherwise be accounted for in the market system.

Many states, however, impose additional, amorphous requirements for approval. In Idaho, for example, regulators cannot approve a change in water rights unless it is in the "local public interest," which is defined as "the interests that the people in the area directly affected by a proposed water use have in the effects of such use on the public water resource."[32] In addition, transfers must "not adversely affect the local economy of the watershed or local area within which the source of water for the proposed use originates."[33]

These requirements can become even more expansive when the proposed water transfer would involve moving water between basins or in another geographically extensive manner. A stark example comes from Texas, which imposes extensive requirements for inter-basin transfers, including multiple hearings with notice and public comment, and a loss of seniority for the transferred right. To approve the transfer, state regulators in Texas must consider factors ranging from "the need for the water in the basin of origin," the "availability of feasible and practicable alternative supplies," the "projected economic impact" and the "proposed mitigation or compensation, if any, to the basin of origin by the applicant."[34]

At first blush, many of these requirements may seem like common sense. After all, few would argue that a transfer should be approved if it would harm the local community. In practice, however, proving a lack of harm can be a costly and time-consuming process, and it introduces a large degree of subjectivity into the approval process that can be used to grant or deny projects for political reasons. Imagine if similar "impact on the community" assessments were required before a restaurant could move locations or an individual could buy a car. Making approvals costly induces stagnation, which is itself economically harmful to the surrounding community.

To the extent that third-party considerations are involved in the approval process, they should be narrowly focused on environmental harms, rather than amorphous economic impacts that are difficult—if not impossible—to quantify objectively, and that will be positive for voluntary transactions in any case.

Expand expedited review for short-term leasing

Apart from reducing the regulatory approval requirements in general, states can also create a special, more expedited approval process for cases where the potential harms are not as great. Several states allow expedited approval for short-term water leases (as opposed to permanent sales), at least for certain purposes. In Nevada, for example, one-year transfers can be approved without notice or a hearing if regulators determine that the change is in the public interest and will not interfere with other water rights.[35] Similarly, in Montana, a water right holder may lease all or part of their water rights for a period of up to 90 days for road construction and dust abatement without prior approval.[36] States have been particularly likely to use an expedited process for approving short-term leases for environmental flows, on the grounds that such transfers are unlikely to be harmful.

Although many states have some form of expedited process, in practice, the effectiveness can vary wildly. The contrast between Oregon and California, for example, is stark. While Oregon has approved nearly 2000 short-term leases, California has approved a mere 34. This is because California has an expedited approval process for short-term leases, but it is only available for leases of a year or less and even the expedited process is lengthy and burdensome. In some cases, the length of the approval process can last almost as long as the lease itself. By contrast, in Oregon, a short-term lease can be for up to five years and is typically approved in 30 days.[37]

An expedited process that is still cumbersome and costly undermines its own reason for existence. Other states should

31. N.M. Stat. Ann. § 72-5-18

32. Idaho Code Ann. §§ 42-222; 42-202b

33. Ibid. § 42-222.

34. Texas Water Code Sec. 11.085(k)

35. Nev. Rev. Stat. § 533.345

36. Montana Code Ann. § 85-2-410

37. Szeptycki et al., p. 19. https://www.pacificresearch.org/wp-content/uploads/2017/06/4_WITW-WaterRightsLawReview-2015-FINAL.pdf.

look to states like Oregon and Washington to see how an effective streamlined process can safeguard the environment without deterring needed water transfers. Allowing transfers will be critical to the West's future ability to adapt to climate change.

Encourage transfers through water banking

One barrier to water right transfers is informational. A transaction clearinghouse or "water bank" can help overcome these problems by helping to match willing buyers and sellers, set pricing and perform other administrative or technical services. A water bank can be particularly useful in cases where a buyer seeks water from multiple sellers.[38]

At least in name, most states already maintain a form of water bank, however, the structure and function of each one differs greatly by state. In some cases, the bank simply serves as a storage facility and is not used to conduct transfers. Some banks, by contrast, do not store water at all, but only serve as a "paper exchange" for transfers of rights. This structure might be thought of as analogous to a commodities exchange, where ownership interests, rather than the commodities themselves, are what change hands.

To date, water bank activity has been limited, partially because of restrictions on participation. For example, California's water bank is limited to existing water rights holders. States should look to increase activity in water banks and structure them as an efficient vehicle for transfers, rather than just a holding facility.

CONCLUSION

No policy reform is a panacea. In many parts of the western United States water is vastly over-appropriated, and rising temperatures and growing populations will only put further strain on an already overtaxed system in the coming decades. But the dire nature of the water availability crisis only underscores the need for reforms that can increase conservation and free up water for more beneficial use. If more widely adopted, many potential reforms already implemented in some states could help ease the transition to the warmer world of the future.

ABOUT THE AUTHOR

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38. "Analysis of Water Banks in the Western States," pp. 3-7. http://www.waterlawsymposium.com/sites/default/files/Water%20Banks%20in%20the%20West.pdf.